

15¢

August 25, 1956

VOL. 79, NO. 6

PAGES 113-128

\$5.50 A YEAR

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



"Picture-Phone"

See Page 118

A SCIENCE SERVICE PUBLICATION

NOT TILL 1971

will MARS be again so close for you to view!

See MARS Sept. 6th

Observe the Red Planet with this 50mm Telescope! It has been many years since Mars has been so close and it won't be so favorable to view for another 15 years. Take advantage of this opportunity. Mars can be seen clearly for only a few months preceding and afterwards. Order this Telescope now to practice for best results on September 6. 50mm Telescope comes complete with movable tripod magnification 50x. Already assembled. 15 lbs.

Complete
\$39.95
F.O.B., N. Y.



60mm Telescope

Extraordinarily fine refracting instrument. Precise controls. Image is erect—not upside down. No wavering. Azimuth clamp. A valuable addition to any laboratory, school or scientific household. 3 Eyepieces—89x, 64x, 40x, Sun Glass and Tripod. 20 lbs.



Complete
\$99.95
F.O.B., N. Y.

40mm Telescope

A clear, accurate stable telescope for planets, stars or ground observation. Complete with Tripod and Case. 20 lbs.



Complete **\$19.95** F.O.B., N. Y.

WRIST RADIO



Complete
\$29.95

Weight: 2.5 Oz.

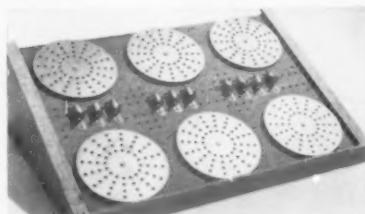
A broadcast band all-transistor radio has been designed with RF reflex circuit to provide good selectivity and sensitivity. In moderate signal strength areas, no antenna is required up to a distance of 25 miles from a broadcast station of average power. Good consistent reception can be obtained over 35 miles with the use of a wire from 8 inches to 3 feet. The use of transistors makes it a rugged device not subjected to tube breakage. Rugged high quality components are used throughout. Normally the transistor will not have to be replaced for the life of the instrument. Extreme economy of operation is obtained through the use of special circuitry requiring very low current, thus prolonging the life of the mercury cells. The small size makes it the ideal radio. It can be worn on the wrist where it easily fits under the sleeve of a jacket or worn in a shirt pocket.

GENIAC® ELECTRIC BRAIN

COMPUTES, PLAYS GAMES, "REASONS", COMPOSES MUSIC

BUILD IT YOURSELF in a few hours!

Here's a wonderful kit that gives you a fascinating introduction to the logic machines of our modern age! The devices you can build test intelligence, code and decode, count, play Tic-tac-toe, solve problems! Converts from binary to decimal—reasons in syllogisms—computes!



APPLICATIONS OF GENIAC

SIMPLE COMPUTER CIRCUITS for binary decimal adding, subtracting, dividing, multiplying machines. PROBLEMS in symbolic logic, reasoning, comparing. INTELLIGENCE TESTING and EXPERIMENT. GAME PLAYING CIRCUITS for tic-tac-toe and nim. ACTUARIAL ANALYSIS. NEW! COMPOSE MUSIC—work out your own tunes automatically!

WHAT COMES WITH THE KIT?

1—SIMPLE ELECTRIC BRAINS, AND HOW TO MAKE THEM . . . 64 page experimental manual. 2—MINDS AND MACHINES . . . 200 page text on computers, automation and cybernetics. 3—WIRING

WHO ARE OUR CUSTOMERS?

Remington Rand • International Business Machines
Bernard College • Westinghouse Electric • Albert
Einstein Medical College • Naval Research Laboratories • Kansas State University • Duke University • Bell Telephone Laboratories • Hundreds of Junior and Senior High Schools

DIAGRAMS for basic GENIAC circuits. 4—BEGINNERS MANUAL. 5—GENIAC study guide . . . the equivalent of a full course in computer fundamentals, lists additional readings. 6—Over 400 parts and components with plastic "PARTS TRAY". Returnable in seven days for full refund if not satisfied.

Oliver Garfield Co., Dept. SL-44
126 Lexington Ave., New York 16, N.Y.

Please send me: ☐ 60 mm Telescope \$99.95
F.O.B., N. Y. ☐ 50 mm Telescope \$39.95
☐ 40 mm Telescope \$19.95

☐ Wrist Radio \$29.95, Postpaid
GENIAC Construction Kit & Manuals
☐ \$19.95 East of the Mississippi
☐ \$29.95 Elsewhere in U.S.
☐ \$21.95 Outside U.S.

My name and address are attached.

TECHNOLOGY

Develop "Picture-Phone"

Commercially practical system permitting persons to see one another while talking has been operated from West to East Coast. The talk-see system uses one pair of additional wires.

See Front Cover

► YOU will be able to "see" by telephone.

The forerunner of a commercially practical "picture-phone" system that permits persons to see one another while talking has operated across the continent between Los Angeles and New York.

The new talk-see system uses an additional pair of ordinary telephone wires such as used for speech to send the pictures. Developed at Bell Telephone Laboratories, it was reported at a joint meeting of the Institute of Radio Engineers and the West Coast Electronic Manufacturers' Association in Los Angeles.

With the system, it will be possible for a caller's picture to be "dialed" like an ordinary telephone call, provided the switch on the picture equipment is on at both ends of the line. If off, the call will go through anyway. Pictures can be turned on after a call is underway. It is also impossible to be seen by the caller unless your switch is on.

Experimental pictures have varied in size from one by one and one-half inches to two by three inches. Head and shoulders can be seen and facial expressions are recognizable.

The new system is not television. It differs from TV principally in the number of pictures transmitted. TV sends 30 pictures a second at high frequencies, requiring expensive coaxial cable and microwave relay systems. It produces a very clear and detailed picture, as shown in the photograph on the cover of this week's SCIENCE NEWS LETTER.

The Picture-phone, on the other hand, sends a smaller and less detailed picture every two seconds. It can be transmitted over standard low-frequency telephone channels, like those now used in homes.

Now undergoing further development, Bell expects that the system could be offered as an optional telephone service.

One of the many experimental sets now in use uses a miniature television camera mounted on a desk. It is about the size of a small suitcase and, instead of bright lights required on a TV stage, requires only natural daylight or moderate amounts of artificial light.

Only one other line, consisting of a pair of wires like regular telephone wires, would be installed on the customer's premises to carry the picture. A Picture-phone caller checks his position in front of the camera by a visual guide. He can be photographed when within the guide lines.

Discussing the future developments of the see-it-as-you-talk system, Bell scientists

said that, in its present form, equipment for the Picture-phone is bulky and expensive.

"However," they add, "a number of avenues are being explored for reducing size, complexity and cost."

The Picture-phone system was devised by Winston E. Kock, Floyd K. Becker, R. L. Miller and others.

Science News Letter, August 25, 1956

GEOPHYSICS

Aurora Recorder Works Automatically

► AURORA, the shimmering lights that occasionally glow in the northern sky from the United States, can now be recorded automatically.

The device is so sensitive it will "see" auroras, or northern lights, too faint to be spotted by humans. It was developed by Dr. D. M. Hunten of the University of Saskatchewan, Saskatoon, Canada, for use

during the International Geophysical Year. The IGY is a world-wide, intensive study of the earth, its seas and skies slated to start July 1, 1957.

The automatic aurora recorder produces tabulated results directly. The sky's light is caught on a small mirror that automatically tilts to different positions across the sky from horizon to horizon every five minutes. A second mirror reflects the light beam through a light chopper, a lens and an aperture to a photo-multiplier.

The photomultiplier's readings are recorded directly on a strip chart for immediate viewing and as numbers on punched tape for later study or for possible automatic analysis. This latter feature is a big improvement over previous recorders.

The device is almost completely insensitive to white light, catching the aurora in green light and recording its intensity. However, if white light becomes very bright, a warning signal is produced.

It is expected to go into operation at isolated stations, relieving personnel from the burden of visual observations, which require staying awake all night to make. Total power consumption of the device and the tape punch is about 280 watts, Dr. Hunten reports in the *Journal of the Optical Society of America* (Aug.).

Financial support for the project was provided by the Defense Research Board of Canada.

Science News Letter, August 25, 1956



THREE-FOOT RADIATION WINDOW—A three-foot thick radiation shielding window weighing three tons, such as pictured here, will be shown by Corning Glass Works, Corning, N. Y., at the Trade Fair of the Atomic Industry in Chicago, Sept. 24 to 26. Measuring 30 by 36 inches on the "hot" side and 18 by 30 inches on the "cold" side, the window has a density of 3.3 and offers shielding equivalent to three feet of barite or magnetite concrete.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

► **Experimentos Animal.**—Le famose Laboratorios Memorial Roscoe B. Jackson a Bar Harbor produce un million de muses per anno, 350,000 destinate al distribution national e international a numerose centros de recerca, le resto pro recercas a Bar Harbor mesme. Iste total annual corresponde a un production diurne de 3000 muses. Inter le 60 racias de muses elevate a Bar Harbor, il ha certes con un historia de genetica regulate correspondente a 4000 annos de vita human.

► **Chirurgia.**—Claudication intermittente ha esse tractate con bon successo per grafos de membrana amniotic. Iste effecto sorprendente esseva discoperite accidentalmente per Dr. E. Troensegaard-Hansen de London. Ille usava le membrana in grafos copiente ulcers del gamba e notava le disparition del claudication que simultaneamente habeva esse presente in certes del patientes. Le explication del effecto anti-claudicante del membrana amniotic es probabilemente que illo stimula le formation de nove vasos de sanguine e assi augmenta le circulation.

► **Pisca.**—Pro taciar migrationes e movimientos de crangones, il es impossibile servir se del usual methodos de etiquetage que functiona si ben in le caso de aves e etiam de pisces, proque le crangon ha le caracteristica de un frequentemente repetite muta que evidentemente disranga omne typo de etiquetage traditional. Le problema ha esse solvite per expertos al Instituto del Scientias Marin al Universitate Texas. Illes injice colorantes in le capites del crangones, e iste colorantes non es afficte per non importa qual numero de mutas. Le resultado es crangones con capites verde, blau, rubie, e altere colores phantastic.

► **Oceanographia.**—Pro studiar le movimento de arena e petras al fundo del oceano presso al costa, scientistas anglese experienta con un methodo de "radiotraciage." In illo, le isotopo barium-140 es inserite in formamines effectuate in petras que es subsequentemente reabandonate in le aqua. Lor movimientos sub le effecto del currentes de fluxo e refluxo es nettamente traciabile per contadores Geiger. On spera que le perfectionamento del methodo va resultar in un importantissime instrumento pro le studios de physiographia costal.

► **Agronomia.**—Le uso del hormon feminin stilbestrol (in forma synthetic) pro accelerar le crescentia de bestial de consumo ha esse approbate per le statunitense Departamento de Agricultura post que extense experimentos practic con administrationes excessivissime de stilbestrol demonstrava que le carne del animales devorante lo non contine ulle tracia mesurable del hormon. Le doses de stilbestrol usate in iste experimentos excedeva per multo le doses maximal que es legalmente autoritate in le ingrassage de bestial.

► **Agronomia.**—Le processo de maturation de fructos es associate con le production de ethyleno. Il pare que le gas ha un function in le processo maturatori mesme, proque so application experimental a varie fructos ha resultate in un certe acceleration de lor maturation. Un gruppo de scientistas del Universitate California ha nunc constatate que le fructo de *Paspiflora* es le champion inter le fructos producente ethyleno. Le facto ha nulle apparente signification practic, sed illo es certo theoreticamente interessante.

► **Anthropologia.**—Un programma de sanitare e hygiene public ha esse initiate inter le indians navajo de Arizona. Le plus notabile

aspecto de iste programma es que illo non es imponente dictatorialmente sed que on cerca pro illo le cooperation voluntari del indians mesme. Le plus grande numero de membros del personal es navajos. On se effortia etiam a obtener le collaboration del exorcistas indian. On admittit que il existe areas de sanitare e hygiene in que le arte del exorcistas es irremplacabile, sed on insiste que il ha etiam areas in que le scientia medical del homines blanc es superior.

► **Psychologia Physiologic.**—Experimentatores al Universitate Illinois ha constatate que rattos pretere normalmente aqua ordinari a aqua distillate. Si le animales suffre grande sete, illos non manifesta ulle tal preferentia. Le experimentatores deriva nulle conclusion ab lor observationes, sed illes nota que le situation es plus o minus le mesme in le caso del humanos.

► **Entomologia.**—Ex le verme de seta *Cecropia*, Dr. C. M. Williams del Universitate Harvard ha succedite a extraher (per medio de petroleo) un hormon que neutralisa per se presentia le factores que causa le metamorphose del larvas de ille insecto in tinea adulte. Le application experimental de iste hormon antime-tamorphic a larvas de *Cecropia* preste a metamorphosis se ha resultate in le desenvolvamento de monstros non-viable. Currentemente on se effortia a synthetisar le hormon antime-tamorphic de *Cecropia* e su equivalentes in altere species de insectos. Si on succede, on va haber trovate le insecticida ideal, proque il es multo improbable que insectos pote unquam devenir resistente contra lor proprie hormones.

► **Medicina General.**—Le mecanismo del promotion de tuberculose per le alteramento si benefice droga cortisona esseva clarificate per un gruppo de medicos de London in Anglaterra qui studiava le problema in casos representative de tuberculose experimental del oculos de muses. Le mecanismo es complexe, sed un principal aspecto de illo es que cortisona paralysa le leucocytes in lor function de annihilare le bacillos tuberculo-tic, de maniera que iste bacillos deveni capace a vencer le leucocytes que es lor inimicos natural.

► **Obstetrica.**—Le cyclo feminin se manifesta, inter alteros, in un fluctuation del temperatura corporee. Iste facto es generalmente cognoscite. Es etiam cognoscite que le temperatura del corpore feminin attinge su maximo plus o minus exactemente al tempore del ovulation (i.e., le evento que initia le periodo le plus favorable pro le conception). Nunc un gruppo de medicos del Universitate California ha demonstrate que le ovulation es etiam (e plus precisemente) recognoscibile per le facto que illo coincide con le maximo del (equalmente fluctuante) conto del plachettas in le sanguine.

► **Entomologia.**—Un inquesta conducte per entomologos del Universitate Rutgers a New Brunswick in New Jersey revela que le majoritate del commissiones pro le lucha contra insectos nocive in Canada e le Statos Unite pretere de plus in plus le uso de mesuras "permanente" in loco del application de insecticidas. Tal methodos "permanente" es super toto le elimination de paludos per drainage o per le desenvolvamento de lacos a aqua fresc in lor loco. Iste ultime methodo utiliza le voracitate natural de pisces pro larvas de insectos. Le inquesta revela etiam que le resistencia de mosquitos contra DDT deveni rapidamente de plus in plus universal.

Science News Letter, August 25, 1956

GENERAL SCIENCE

Reading Interlingua

► **YOU CAN READ Interlingua** if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

Science News Letter, August 25, 1956

SCIENCE NEWS LETTER

VOL. 70 AUGUST 25, 1956 NO. 8

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C. NO. 0077-2255. Edited by WATSON DAVIS.
Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright © 1956 by Science Service, Inc. Reproduction or any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 263) authorized February 28, 1950. Established in mimeographed form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, Eldorado 3-3656, and 435 N. Michigan Ave., Chicago 11, Superior 7-6048.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Paul B. Sears, Yale University; Karl Lark-Horowitz, Purdue University; William W. Rubey, U. S. Geological Survey. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; George W. Corner, Rockefeller Institute for Medical Research; Edward U. Condon, Berkeley, Calif.; Nominated by the National Research Council: Leonard Carmichael, Smithsonian Institution; Jerome Hunsaker, Massachusetts Institute of Technology; I. I. Rabi, Columbia University. Nominated by the Journalistic Profession: Michael A. Gorman, Flint Journal; Neil H. Swanson, Ruston, Md.; O. W. Riegel, Washington and Lee University. Nominated by the Scripps Estate: John T. O'Rourke, Washington Daily News; Charles E. Scripps, Cincinnati, Ohio; Edward J. Meeman, Memphis Press-Scimitar.

Officers—President: Leonard Carmichael; Vice-President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Howard Simons, Dorothy Schriver, Helen M. Davis. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., Glimmer 3-5410.

MEDICINE

"Stiff-Man" State

Medical mystery of cause and cure of curious disease, nicknamed "stiff-man" syndrome, puzzles doctors at Mayo Clinic. First patient seen in 1924.

► A MEDICAL MYSTERY is puzzling doctors at the Mayo Clinic, Rochester, Minn.

"Stiff-man" syndrome is the nickname they give the strange condition. Syndrome means a set of symptoms all occurring together. "Progressive fluctuating muscular rigidity and spasm" is the formal name they give it.

Muscle stiffness, or rigidity or tightness, and muscle spasms, sometimes painful, are the symptoms. The stiffness makes walking difficult and in some cases impossible. A sudden jar, movement or fright brings on the spasms. Describing the spasms, one patient said "pain as if something pulling muscles from bones" and another said "legs stiffen out like hiccups, throwing me to the ground."

The muscles of the abdomen are firm, hard or board-like. The overall rigidity draws the head into the shoulder girdle, and makes the spine curve or draws it into a hump or gives it the appearance of a poker spine. This rigidity and drawing make the gait stiff and laborious and, when the patient falls because of spasm of leg muscles, makes him fall "like a wooden man" or a "wax dummy."

The first patient seen at the Mayo Clinic with this condition was a 49-year-old Iowa farmer. He came to the Clinic in the summer of 1924. Since then, the doctors have seen 13 more patients with the same mysterious malady, 10 men and four women. The average age at the start of the symptoms was 41.5 years. Seven of the patients are still living. Four have died.

No common cause of the condition could be found from critical review of the records of each case. Laboratory tests and other examinations failed to reveal any cause. Results of most of the tests were within normal limits.

"No treatment that we attempted proved to be of material help," Drs. Frederick P. Moersch and Henry W. Woltman state in reporting the cases.

Among treatments used were bromides, barbiturates, alcohol, ether, a curare preparation, chlorpromazine, a form of cortisone and injections into the muscles of magnesium sulfate. One patient was given a ten-day course of tetanus antitoxin with no change in symptoms. Baths and active or passive exercise gave only limited relief.

Chronic tetanus, or lockjaw, was considered, but the spasms of the stiff-man syndrome did not affect the jaw, developed less abruptly, were less violent and relaxation took longer and was more gradual.

Because the intensity of symptoms fluctuates and because four patients had re-

ducing substances in the urine, the doctors think a metabolic, or body chemical, basis for the malady should be considered.

Reporting the 14 cases in the *Proceedings of the Staff Meetings of the Mayo Clinic* (July 25), the two doctors state, "Thus our story ceases for the present. The threads are there but, in spite of their being woven into a fairly constant pattern, the completed design awaits added study."

Science News Letter, August 25, 1956

AERONAUTICS

Research Center Planned for Nevada

► AN OUTDOOR RESEARCH CENTER for testing the latest aeronautical advancements is being planned in Nevada by the Curtiss-Wright Corporation.

Purchase of the land for the project was disclosed by Roy T. Hurley, president and board chairman of the Curtiss-Wright Corporation, during a tour of a similarly remote project at Quehanna, Pa. The Nevada land takes in about four times as much territory as the 80-square-mile Quehanna center.

Like the Quehanna development, the Nevada project will involve testing equipment that cannot be tested in densely populated areas. It has many of the same advantages as the Quehanna site.

Scientists are free to try experiments they would not attempt in places where noise, odors and carbon dust might offend residents.

Seclusion is the chief safeguard in both research areas. The Quehanna project is located in the heart of a dense state forest about 150 miles northeast of Pittsburgh. The trees in the wilderness area provide an effective sound barrier. Noise will be rendered inconsequential at the Nevada center by the project's extremely isolated location.

Outlining the significance of the two developments, Mr. Hurley predicted a considerable increase in outdoor research areas among other industries.

"Many firms will have to use outdoor areas for testing whether they like to or not," Mr. Hurley said. He explained that large-scale testing of loud or gas-yielding equipment is cheaper and more practical in remote areas than in populated regions.

A jet test cell in or near a city costs about \$1,500,000. A test cell in a remote location can be built for \$300,000 to \$400,000. The difference is due primarily to the need for sound-proofing measures in populated areas.

Science News Letter, August 25, 1956

● RADIO

Saturday, September 1, 1956, 1:45-2:00 p.m. EDT "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station. Asher S. Braunfeld, head of the Quarries Section, Israel Ministry of Development, will discuss "Minerals in Israel."

PUBLIC HEALTH

Salt and Soda Seen Good for Burn Shock

► DRINKING LARGE AMOUNTS of salt and soda solution is effective emergency treatment of shock due to burns, Dr. Kehl Markley, U. S. Public Health Service, reports in the *Journal of the American Medical Association* (Aug. 11.)

Dr. Markley's report is based on three and a half years of studying the treatment in three cooperating hospitals in Lima, Peru. Associated with Dr. Markley were these Peruvian physicians: Drs. Manuel Bocanegra, Augusto Bazan, Roberto Temple, Miguel Chiappori, Guillermo Morales and Alberto Carrion.

Among 110 children and 83 adults, all severely burned, no significant difference in deaths was found between those given salt and soda solution to drink and those given conventional anti-shock treatment of blood, plasma or plasma extenders injected into the veins.

The salt and soda treatment was shown effective in laboratory animals in earlier studies by Dr. Sanford Rosenthal and associates of the Public Health Service.

The Lima study was done to evaluate the treatment in humans because of its possible usefulness in case of mass catastrophes.

Science News Letter, August 25, 1956

PHYSIOLOGY

Screen Tranquilizers by Brain Self-Stimulation

► THE DISCOVERY that a rat will press a switch to get an enjoyable electric stimulus through its brain could be used to screen drugs for tranquilizing action, Drs. J. Olds, K. F. Killam and P. Bach-y-Rita of the University of California at Los Angeles School of Medicine suggest.

When given chlorpromazine and reserpine, two of the earliest tranquilizing drugs, the rat pressed the switch at a different rate than when given a sleep-inducing barbiturate drug.

Where the electrodes were placed in the rat's brain to carry the stimulating current also affected the animal's response to the drug, so further studies with the technique should also give information on which sites in the brain are acted on by the tranquilizing drugs.

Findings with the method are reported in *Science* (Aug. 10).

Science News Letter, August 25, 1956

PUBLIC HEALTH

Latest Fallout Report

Atomic Energy Commission releases figures on radioactive fallout, including gamma dosage for the first time. Counts are monitored by 88-station, world-wide network.

► THE UNITED STATES has received a larger average dose of gamma radiation as a result of atomic and hydrogen bomb tests than has the rest of the world.

This is shown in the latest Atomic Energy Commission report on radioactive fallout in *Science* (Aug. 10).

The report, which gives the figures for radioactive fallout throughout the Western World through September, 1955, is the first official one to include the gamma dosage.

The gamma dose is included, Merrill Eisenbud and John H. Harley of the AEC's Health and Safety Laboratory in New York state, because geneticists use it as the basis for estimating the number of radiation-induced chromosome mutations in the population as a whole.

The atomic health experts point out that the average dose of gamma radiation between 1951 and 1955 has been about 10 millirads. This, they say, is small when compared to the gamma radiation the population receives from natural sources and cosmic rays, which is put at 300 millirads for the same time period.

The report's figures are based on the AEC's fallout-monitoring network that involves some 88 stations throughout the world, including 26 in the United States. Aim of the network is to estimate the levels of human exposure produced by radioactive fallout at great distances from nuclear detonations.

Data include the cumulative surface deposits of mixed fission products and strontium-90, which often ends up in human bones, and the cumulative gamma dose.

The report shows that the highest recorded accumulation of mixed fission products was at Grand Junction, Colo., with 740 millicuries recorded per square mile. The lowest was recorded at Lagos, Nigeria, with 33 millicuries per square mile.

Estimates of strontium-90 ranged in the United States from 2.1 millicuries per square mile at San Francisco to 23 at Salt Lake City. Estimates of the average gamma dosage show that the range of values in this country are relatively narrow, 6 to 49 millirads, except for Salt Lake City, which recorded 160 millirads; Grand Junction, which recorded 120, and Albuquerque, N. M., which recorded 110.

The representative dose for eastern United States is about 15 to 20 millirads, with slightly higher values in the Middle West and lower values on the West Coast.

The report also points out that weathering and shielding play an important part in estimates of radioactive fallout. For people in cities, for example, "the true dose is very much reduced by the fact

that fallout to the surface is soon washed into gutters and sewers. For these reasons, it is likely that the actual dose to urban populations does not exceed 10% of the values reported."

The significance of the findings, scientists Eisenbud and Harley state, are these:

1. The gamma dose delivered from fallout to date is only three percent of the average gamma dose from natural sources. Thus, even the maximum theoretical dose from fallout is a small fraction added to natural radioactivity, and has a greatly reduced effect when compared to the natural variations that occur from time to time.

2. Strontium-90 is absorbed by humans, plants and animals. Its measurements in foodstuffs can now be taken by scientists. Thus, a study of milk in the United States made early this year showed it contained only 1/350th the amount of strontium-90 that would be needed to make the milk harmful to drink.

The report concludes on this note, "according to the National Academy of Sciences, 'already some children have accumulated a measurable amount of radioactive strontium in their bodies. The amount, however, is quite small—a thousandth of what is considered a permissible dose.'"

Science News Letter, August 25, 1956

METEOROLOGY

Hurricane-Steering Winds

► THE DIFFICULTY in forecasting the paths of hurricanes more than a few hours in advance is that they are steered by high-altitude winds.

Only the general wave-like patterns of these planet-wide, upper atmosphere wind belts are known.

Embedded in this world-circling stream is a continuous parade of whirls or eddies. It is these large cyclones and anti-cyclones that guide the hurricanes. They are at least hundreds, and more often thousands, of miles across, compared to the 200- to 300-mile diameter of tropical storms.

Because movements of these high-altitude "highs" and "lows" are difficult to forecast, so also are the tracks hurricanes will take.

Learning how to predict hurricane paths more accurately is the aim of an all-out attack initiated this year under the direction of the U. S. Weather Bureau.

The assault on nature's most destructive storms is two-pronged, being on both operational and research levels. Cooperating closely are the Joint Hurricane Warning

ENGINEERING

Scientists Study Brick Masonry

► BRICK MASONRY, one of the oldest construction methods in use today is being studied with a variety of up-to-the minute devices.

In the engineering department of the University of California at Los Angeles, masonry testing equipment includes an ultrasonic device for testing masonry walls, instruments to probe the bond between mortar and brick, building models crumbled by man-made earthquakes and a machine that tears brick walls apart.

The sonic device sends tiny tremors through brick walls. These are reflected back and recorded on an oscilloscope. Characteristic patterns on the scope may reveal unsuspected cracks and other defects. Present masonry tests involve the expensive process of cutting sample cores out of walls and are not entirely satisfactory.

Although brick masonry has been in use for thousands of years, no one yet knows the mechanism of the bond between brick and mortar. Determination of this mechanism may help set new standards for masonry work.

Plastic models of brick buildings are being crushed in a manner simulating earthquakes to find out how masonry fails under these conditions.

Full-scale masonry walls are being torn apart to learn the nature of stresses that act parallel to the way the brick is laid.

The study, which is under the direction of J. Morley English, is being supported by the California State Division of Architecture.

Science News Letter, August 25, 1956

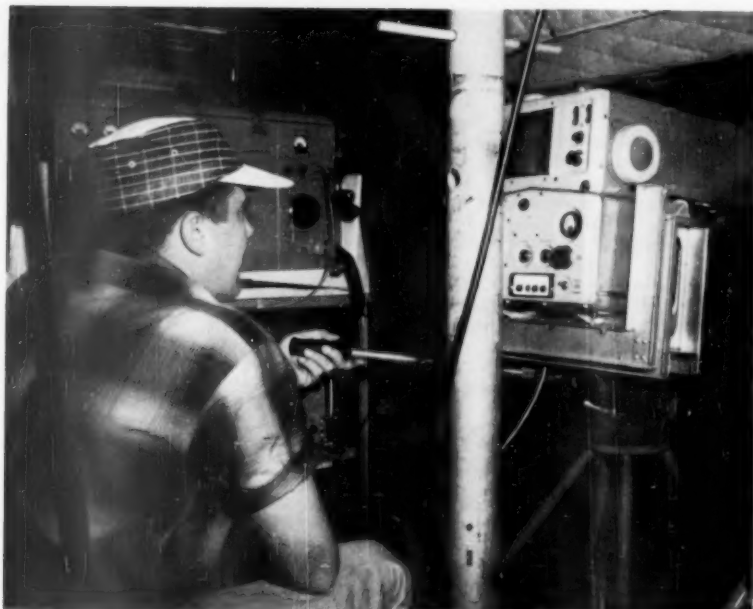
Center in Miami, manned by the U. S. Weather Bureau, Navy and Air Force Weather Service, and the National Hurricane Research Project, under the direction of Robert Simpson, long-time Weather Bureau expert on tropical storms.

The weapons marshaled this year to learn more about hurricanes range from electronic computers to scientists with pencil and paper, from three especially equipped hurricane-hunting research airplanes, in addition to the regular military squadrons, to a network of radar stations.

Present forecasts of hurricane paths are good no more than 36 hours in advance, but the swirling storms are so unpredictable in their courses that even these short-term predictions are not as accurate as weathermen would like, although they do save lives and reduce property damage.

Meteorologists aim not only to improve the accuracy and increase the time range of forecasts, but also to predict where and when the storms form.

Science News Letter, August 25, 1956



FLYING TV STATION—The cabin in this helicopter is a self-contained airborne television station. An engineer for Philco Corporation, Philadelphia, operates the camera for the TV system developed for the Navy Department's Bureau of Ships. The picture picked up by the camera is being transmitted to a receiving location more than 50 miles distant. Philco has also developed an airborne TV system for use in jet aircraft reconnaissance.

PUBLIC HEALTH

Vaccine Cuts Colds

► FROM HALF to three-fourths of the feverish colds or cold-like illnesses expected to attack recruits in training were prevented by a vaccine tried last winter at the U. S. Naval Training Center, Great Lakes, Ill., a team of civilian and Navy scientists reports in the *Journal of the American Medical Association* (Aug. 18).

These feverish colds or grippelike ailments are now being called "adenovirus" diseases. (See SNL, Aug. 4, p. 68.)

They are not the same as the common cold, since they are severe enough to send a recruit to hospital and to make civilians take to their beds. They have heretofore gone by such names as AD viruses, APC viruses, RI viruses and ARD viruses or just "the bug."

The adenovirus vaccine tested at the Naval Training Center was for types 3, 4 and 7. It was commercially prepared from live virus inactivated by formaldehyde.

The vaccine was given to 4,000 recruits in a group of 12,000.

Results of the trial show that the "usual interference with military training routine" resulting from the acute feverish respiratory diseases "may be reduced by adenovirus vaccines."

Reporting the trial are Drs. Joseph A. Bell and Robert J. Huebner of the National

Institutes of Health, Bethesda, Md., where the seed virus for the vaccine was prepared, Capt. M. J. Hantover of the Navy Medical Corps, and Dr. Clayton G. Loosli of the University of Chicago.

Science News Letter, August 25, 1956

MEDICINE

Oleander Sugar Drug Stops Staph. Germs

► A COMPOUND containing the sugary chemical of the oleander bush has turned out to be good medicine for checking staphylococci, especially when the staph. germs have grown resistant to penicillin and other antibiotics.

The staph. family includes germs found in boils and a particularly dangerous kind of blood poisoning.

The new oleander bush chemical for fighting staph. germs is called oleandomycin. It was developed by Ben A. Sobin, John B. Routien and Thomas M. Lees of Chas. Pfizer & Co., Inc., research laboratories, Brooklyn, N. Y.

They have now been granted a U. S. patent for producing oleandomycin by fermentation.

Science News Letter, August 25, 1956

VETERINARY MEDICINE

Lockjaw-Like Dog Disease Curable

► A DOG DISEASE that is similar to lockjaw, and for which there is no vaccine, can be treated successfully if the illness is detected and diagnosed in its early stages, the American Veterinary Medical Association in Chicago has reported. The disease is called eosinophilic myositis.

The lockjaw-like symptoms are caused by an inflammation of the muscles used in chewing. The inflammation is accompanied by an increase in eosinophils, a type of white blood cell, in the blood of the victim. These cells infiltrate jaw muscle tissue, causing so much swelling that in the later stages the jaws cannot be forced open.

Veterinarians say they are not familiar with all the factors involved in the disease. According to one theory, eosinophils are attracted by damaged muscle tissues after the muscle-destroying processes have started.

Eosinophilic myositis hits many breeds of dogs, but has been reported most frequently in German Shepherds. It strikes other animals besides dogs, but with less dramatic symptoms.

Science News Letter, August 25, 1956

NATURAL RESOURCES

Mission 66 to Bring Public Nearer Wilds

► MISSION 66, the 10-year project to develop United States national parks, will actually increase the wilderness value of the parks even though the project involves extensive construction.

This will be done by removing man-made "eyesores" which infringe on scenic areas, National Park Service Director Conrad L. Wirth said.

Buildings, roads, concessions and picnic areas now encroach upon numerous "sensitive" areas in our parks, Mr. Wirth asserted. A "sensitive" area is one of unusual natural beauty or interest.

In some cases, camping grounds will be moved outside the parks altogether. Cabins, lodges and stores will be removed from many scenic areas. Private enterprise will be encouraged to set up concessions outside, rather than within, park boundaries.

National Park Service officials estimate that 99% of all visitors confine themselves to one percent of each park's area. Present roads, which park officials say were designed to meet the demands of the stage-coach era, concentrate masses of people in small localities.

"Few persons have ever really seen our parks," Mr. Wirth stated. "We want to get people to go off on some of the trails and into back areas."

Even after Mission 66 has been completed, large regions of the parks will remain inaccessible to vehicles. An estimated two to three percent of the total national park area will contain 99% of all visitors.

Science News Letter, August 25, 1956

MARINE BIOLOGY

Number Razor Clams In Research Project

► **RAZOR CLAMS**, about 700 of them, have been tagged with a number on their shells and replaced in the sands of the Clatsop beaches somewhere between Seaside and Astoria in a "growth study" by Oregon fish commission scientists.

A carborundum-tipped rotary drill was used in numbering the shells.

"We hope to determine the differences in growth by beach levels," said biologist Robert J. Ayers of Oregon fish commission's Astoria research laboratory, who is in charge of this investigation.

"Do clams off-shore that take food from the water, in an 'inter-tidal habitat,' according to biologists' vernacular, grow at a different rate than clams living high on the beach? We would like to know."

"For observations on other species of clams reveal that some clams grow faster off-shore than those on the beach and in some the reverse is true."

One group of clams will be recovered in six months and the remaining mollusks will be dug in a year.

The study is one of a series, designed to increase knowledge of the species, that has been conducted on razor clams on the Clatsop beaches over several years by fishery biologists of the Astoria laboratory.

Science News Letter, August 25, 1956

ANIMAL HUSBANDRY

Tables Show Amount Of Water Cattle Need

► **THE BEST WAYS** of rationing water among livestock during drought are indicated by newly compiled data at the U. S. Department of Agriculture.

A livestock producer, using the new tables, can estimate the daily water consumption of any large herd of cattle and plan an adequate water system for his farm or ranch.

The information, which has not been generally available, was obtained at the request of livestock producers, county agents and agricultural engineers from many parts of the country.

The material represents research and experiments by two Department of Agriculture scientists, Dr. C. F. Winchester and M. J. Morris, who say feed and water consumption are closely related. If water is limited, feed should be curtailed. In a severe drought, livestock raisers can cut their animals' water consumption in half simply by giving them half their normal feed ration.

The scientists warn, however, that this method should never be used with lactating cows if it can be avoided, because milk production may be impaired by the procedure. They investigated the amounts of water consumed by different classes and sizes of beef and dairy cattle at varying

temperatures and at various rates of feed consumption.

A 1,000-pound animal kept on just enough feed to maintain its weight will consume four gallons of water a day when the temperature is 40 degrees Fahrenheit. It will consume six gallons at 70 degrees and nine gallons at 90 degrees.

A 1,000-pound steer or heifer gaining a pound a day, the normal gain on good range land, needs seven gallons of water a day at 40 degrees, ten gallons at 70 degrees and 17 gallons at 90 degrees.

The scientists say their tables, called the Winchester-Morris tables, should not be used to judge the water needs of individual animals or small herds because each animal's water requirements vary widely.

The tables are available from the Information Division, Agricultural Research Service, U. S. Department of Agriculture, Washington 25, D. C.

Science News Letter, August 25, 1956

GENETICS

Suggest Premarital Test To Check Mental Defect

► **ENGAGED COUPLES** may in the future have a blood test to forestall the chances of having offspring afflicted with one kind of mental defect.

This suggestion comes from research by Dr. David S. Hsia, Miss Kathleen W. Driscoll, Walter Troll and Dr. W. Eugene Knox at Harvard Medical School, Children's Medical Center and New England Deaconess Hospital, Boston.

The mental disorder or defect is called phenylketonuria. It occurs on the average of once in every 40,000 births. Afflicted children fail in both mental and physical development. Some may be idiots, others imbeciles.

The disease is due to a defect in the way the body handles the amino acid, phenylalanine. This acid is normally metabolized at a high rate by a liver enzyme. A high amino acid level in the blood points to a lack of the gene that carries the potential for production of the vital liver enzyme.

Testing the blood of engaged couples for the level of phenylalanine will show whether either of the two lacks this gene. If both lack it, there is "a distinct possibility that one in four of their offspring might be mentally defective," Dr. Hsia declared in a report to the First International Congress on Human Genetics in Copenhagen, Denmark.

One in every 100 persons, he estimated, lacks in varying degree a normal amount of the liver enzyme in the blood. Unless both parents have the genetic lack, however, the disease does not attack their offspring. The odds of a marriage between two persons with similar lacks are about one in 10,000.

For children already afflicted with the condition, a diet excluding most of the phenylalanine shows considerable promise.

Science News Letter, August 25, 1956

IN SCIEN

GENETICS

Sex Life of One-Celled Animal Made Clearer

► **A MYSTERY** in the sex life of a one-celled animal has been cleared by Dr. T. M. Sonneborn of Indiana University. He discovered that paramecium is of two distinct types sexually, the inbreeders and the outbreeders.

The inbreeders, Dr. Sonneborn said at the First Annual Lectures in the Natural Sciences at the University of Colorado, Boulder, mate with close relatives. Outbreeders mate with strangers.

This explains the wide differences found among varieties of the same species of the tiny animal widely used in heredity studies, he said. "Arrays of ingenious devices," he pointed out, assure self perpetuation of the one-celled creature.

The inbreeders, for example, mature young, while the outbreeders have a long period of immaturity, giving them time to wander from their kin before they mate.

Science News Letter, August 25, 1956

CHEMISTRY

Chemistry Helps Place Missing Link Animal

► **CHEMISTS** have found new knowledge on the evolution of mystery animals that should be missing links between backbone and non-backbone animals.

The studies were made by Drs. J. F. Morrison, D. E. Griffiths and A. H. Ennor of the John Curtin School of Medical Research, Australian National University, Canberra.

The mystery animals live in the water, although they are not fishes. Scientists know them as protochordates. The particular group of protochordates studied by Dr. Morrison and associates are called tunicates because their bodies are encased in a little tunic or jacket looking like a small bag. Sea-squirts, which send forth a couple of jets of water if touched, are tunicates.

The tunicates' place near the vertebrate animals seemed challenged by earlier chemical findings. Chemically, animals are classed as vertebrates if they have creatine in their bodies and as invertebrates if they have arginine.

The earlier findings suggested that the tunicates contained arginine.

Dr. Morrison and associates, however, now report that at least two species of tunicates do have creatine and do not have arginine. So the tunicates probably will continue to be classed as protochordates, they report in *Nature* (Aug. 18).

Science News Letter, August 25, 1956

THE FIELDS

PHARMACOLOGY

Tranquilizer and Atomic Drug Go in Pharmacopeia

► AN ATOMIC AGE CHEMICAL, sodium radiophosphate (P-32), and one of the modern tranquilizing drugs, chlorpromazine, are going into the U. S. Pharmacopeia through a supplement to the U.S.P. XV.

The Pharmacopeia is a book providing standards for the most important medicines used in the United States and many Latin American countries. Its standards are enforced by the U. S. Food and Drug Administration and by many state and municipal health agencies.

The Pharmacopeia was established in 1820 and is revised every five years by a national voluntary committee of medical and pharmaceutical experts.

The first supplement to the Fifteenth Revision was published Aug. 20, and all changes and additions given in this supplement are effective as of Sept. 1, 1956.

This first supplement was scheduled for earlier publication, but was held with the hope of including another famous tranquilizing drug, reserpine. Even with the delay in publication, however, the reserpine material could not be got ready because of difficulties with respect to assay.

It is hoped now that these difficulties can be overcome so reserpine will be able to get official U.S.P. standing before the end of 1956.

Science News Letter, August 25, 1956

MEDICINE

Ice Bath and Massage For Heatstroke Victims

► HEATSTROKE VICTIMS should be promptly and totally immersed in an ice bath and given vigorous massage to bring down their high body temperature, advise Drs. Martin G. Austin and John W. Berry of St. Louis on the basis of experience with over 1,000 heat victims.

These 1,000 were seen at the St. Louis City Hospital in three of the six hottest summers in 125 years in St. Louis.

Heatstroke victims have characteristically hot, dry skins. Their temperature usually goes above 106 degrees Fahrenheit. They show signs of brain and nervous system abnormality ranging from lethargy to coma, or unconsciousness.

The ones in greatest danger are those showing the most severe nervous system symptoms.

Heat victims can be expected under the following conditions: 1. unusually high temperature, above 95 degrees Fahrenheit, in late spring or early summer; 2. extremely high temperatures, over 100 degrees Fahrenheit, later in the summer or in early fall; 3. a prolonged, continued heat wave.

Mortality from heat stroke has been reported as high as 38% to 70%. The St. Louis physicians had only a 17% mortality in the cases they saw during the three very hot years of 1952, 1953 and 1954. They attribute the improvement to the rapid methods of cooling used, use of drugs to keep the blood pressure up, determination of salts in the blood stream and correction of any abnormalities, and use of antibiotics prophylactically.

Signs of impending heatstroke are nausea, vomiting, dizziness, headache, muscle cramps, feeling of hotness and breathlessness.

Patients with heart and blood vessel disease are particularly vulnerable to heatstroke.

Such patients and those showing the warning signs of heatstroke should be promptly protected from further exposure to heat during sudden or prolonged hot spells. Air-conditioning units, fans and other devices, the St. Louis doctors state, will help reduce the number of heatstroke casualties.

They report their experiences in the *Journal of the American Medical Association* (Aug. 18).

Science News Letter, August 25, 1956

GENETICS

Males Responsible for Spontaneous Mutations

► PAPAS are more responsible than mamas for spontaneous, or non-radiation-caused genetic changes, or mutations, in their offspring and descendants.

This is true for fruit flies. Whether or not it is also true for humans and other species is not yet known.

This hitherto unsuspected sex difference in mutability was discovered by Prof. Bentley Glass and Mrs. Rebecca K. Ritterhoff of Johns Hopkins University, Baltimore.

The discovery raises again the whole question of the relative danger of radiation to the two sexes.

The finding applies so far only to mutations with visible effects, such as change in eye color. Whether it holds true for deadly mutations is not known yet. Prof. Glass and Mrs. Ritterhoff are trying now to find this out.

If this unsuspected sex difference in mutability applies to all genes, it would change the "doubling dose," or the dose of radiation that would double the spontaneous mutation rate. It might mean that a much smaller radiation dose to females might be serious.

The large sex difference in mutability in fruit flies, about one order of magnitude greater in males than in females, makes it "imperative," the Hopkins scientists declare, to investigate the question of whether a similar difference exists in humans and other species.

Details of their findings are reported in *Science* (Aug. 17).

Science News Letter, August 25, 1956

EDUCATION

Suggest Changes in Educational Programs

► LARGER DOSES of mathematics and the basic sciences in both high school and college is the best cure for the nation's current deficiency of engineering talent, members of the American Society of Mechanical Engineers reported.

Questioned by the Society at a recent meeting, the engineers said changes in high school and college educational programs, together with steps to be taken by industry, could remedy the shortage.

The engineers suggested that courses in mathematics, physics and chemistry should be added, improved or made compulsory in the high schools. In college, the majority of respondents urged, emphasis should be placed on the fundamentals of mathematics and science and the emphasis on specialized courses reduced.

In suggesting industry's part in alleviating the shortage, 34% of the engineering group who answered the questionnaire said engineers now in industry should be relieved of routine work that could be done by less-highly-trained technicians.

The results of the survey, released by C. E. Davies, secretary of the Society, also showed that those engineers who graduated from high school before 1936 held a significantly better opinion of their own education than did later graduates.

Similarly, pre-1946 graduates tended to rate their colleges higher than did the post-war graduates.

Science News Letter, August 25, 1956

TECHNOLOGY

Old Wood as Strong as New

► OLD WOOD is as strong as new wood, research by U. S. Department of Agriculture scientists shows.

Recent tests by Forest Products Laboratory researchers showed the floor joists of the Octagon Building, Washington, D. C., are as strong as when they were installed more than 150 years ago.

Stress tests indicated the southern yellow pine timber was strong enough to stay in service at the historically famous building. The wood passed the examination with as high a score as newly cut timber.

Some of the strength values were lower than average for southern pine, but Forest Service officials say this does not mean a deterioration from age, but rather reflects the variations in timber.

Tests were made on sections from several parts of the joists, all of which came from protected areas.

The Octagon Building dates back to 1798. It is historically famous because it served as President Madison's residence after the White House was burned during the War of 1812. Since 1899 it has been occupied by the American Institute of Architects.

Science News Letter, August 25, 1956

ASTRONOMY

Mars Closest in Years

Red planet will be only 35,120,000 miles away at midnight on Sept. 6, Eastern Standard Time. Astronomers train telescopes on Mars in hopes of solving some of planet's puzzles.

By JAMES STOKLEY

► THE LONG-AWAITED VISIT of Mars to the earth is now here. The red planet now shines brilliantly in the southeastern evening sky.

At midnight on Sept. 6, E.S.T., its distance will be only 35,120,000 miles—closer than it has come since 1924. Not until 1971 will it come even nearly as close.

Such an approach of Mars occurs when the planet is at opposition, i.e., when it is in a part of the sky directly opposite the sun. Consequently, in September it will be rising in the east as the sun is setting in the west, and thus will remain visible throughout the night.

Mars is now in the constellation of Aquarius, the water carrier, and its position is shown on the accompanying maps. These depict the sky as it appears about 10:00 p.m., your own kind of standard time, at the first of September, an hour earlier at the middle of the month, and two hours earlier at the end. (Add one hour for daylight saving time).

Mars Easy to Identify

The magnitude of Mars, on the scale used by the astronomer, is minus 2.6 far brighter than any other object seen in the evening, with the exception of the moon. This, and its red color, make it easy to identify.

Earlier in the evening, however, another planet can be seen. This is Saturn, which is in the constellation of Libra, the scales, a group that sets before the times for which the maps are drawn.

Just as soon as darkness has fallen, Saturn can be seen in the southwestern sky—of magnitude 0.8. This is equal to a first magnitude star, but is only about a twenty-fifth as bright as Mars.

Saturn and Mars are the only planets visible in the September evening skies. The other bodies shown are stars which, like the sun, shine with their own light.

The planets, on the other hand, are visible because of the sunlight they reflect to us. Also the planets are much closer. They are members of our own family of orbs which revolve about the sun.

The brightest star now visible is Vega, in Lyra, the lyre, high in the west, and nearly twice as bright as Saturn. Below it, to the left, is Aquila, the eagle, in which Altair shines. And practically overhead is Cygnus, the swan, of which Deneb is the brightest star.

Three other stars shown are of the first

magnitude, but all are quite low, so their brightness is dimmed on account of the greater thickness of the earth's atmosphere through which their light has to pass in reaching us. One is Capella, in Auriga, the charioteer, which is near the northeastern horizon. During winter months this star climbs high overhead.

Low in the south is Piscis Austrinus, the southern fish, with the star called Fomalhaut. This is a group in the far southern part of the sky, now almost as high as it ever rises for us.

Low in the northwest we find Arcturus, in Bootes, the bear-driver, which shone high in the south in evenings of May and June, but is now about to disappear for a while.

Venus Also Visible

The planet Venus, so brilliant in the evening a few months ago, is now prominent in the east for several hours before sunrise. It is even brighter than Mars. Of the other naked-eye planets, both Mercury and Jupiter are now nearly in line with the sun, and above the horizon only during daylight hours, when they cannot be seen.

Even though Mars is now making the closest approach in 32 years and is being observed with some of the world's greatest telescopes, it is still not possible to see it as well as we can view the moon through a good pair of binoculars.

Despite this handicap, intensive studies made over the years have revealed many facts about it. This year, with newer instruments and improved techniques, some of the remaining puzzles may be solved.

Chief features of the planet, seen through a good-sized telescope, is the white areas around its poles. At present the south pole

of Mars is turned to our view, and it is the southern hemisphere which we can observe best.

Spring began there on May 4 (by our calendar) and summer comes on Sept. 27. During this time the southern polar cap has been receding, but it seldom disappears completely. The one around the north Martian pole, which we can see at other times, never disappears.

While these caps are undoubtedly frozen water, they are not deep fields of snow and ice, like those around the poles of the earth. Rather do they seem to be very thin deposits of frost.

Polar Caps Evaporate

They do not actually melt, but evaporate. Even solid ice can pass directly into the vapor phase, without first turning to water, and wet clothes (on earth) will dry on the line even in winter, with the temperatures continually below freezing.

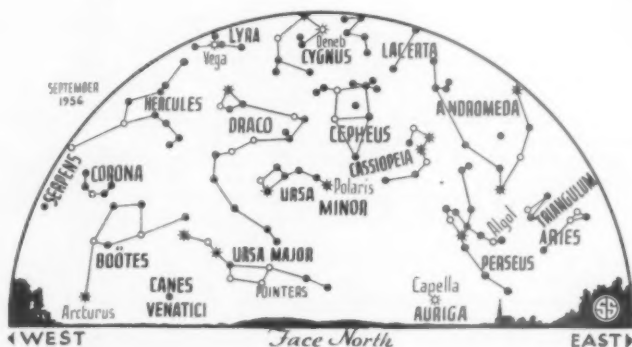
Something like three-quarters of the surface of Mars is covered with areas that are reddish or yellowish in color. These are thought to be mainly deserts.

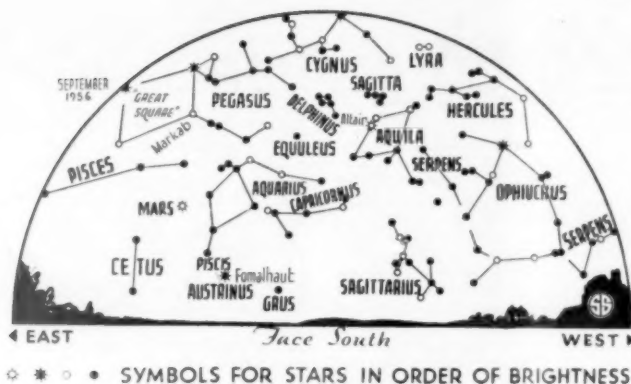
The red areas may be of a mineral like some of those known on earth, consisting largely of iron oxide—that is, iron "rust." But about a fifth of the surface is dark, and these areas change color with the advancing Martian seasons.

Since they show greenish hues, it is believed that these are areas of vegetation—however, they could hardly be forests like those on earth, or even grassy plains, because of the rigorous conditions that exist there.

With an instrument called a thermocouple, attached to a large telescope, temperatures have been measured on the surface of Mars.

Although determinations made by different observers vary somewhat, it has been estimated, by W. W. Coblentz, for example, that it may get above 86 degrees Fahrenheit at noon, when closest the sun, and that





day just what they actually are we will be disappointed. They may turn out to be something of which we already have some general knowledge, and we will wonder why nobody ever thought of that.

A full explanation may not come until interplanetary exploration has made it possible to go to Mars and see what the canals really are.

On the other hand, at some earlier stage of space travel we may be able to establish an observatory above the earth's atmosphere, where astronomers can use enormously powerful telescopes without the difficulties now encountered as we try to look from the bottom of the earth's ocean of air. And then, on some future close approach of Mars, the puzzle may be solved.

on the dark side it may drop as low as 150 below zero. The mean temperature would be in the neighborhood of 10 degrees, as compared with about 60 on the earth.

Mars has an atmosphere, although at the surface it is only about an eleventh as dense as the earth's at sea level, that is, about the same density as ours would be at an altitude of 11 miles. It contains little if any oxygen, certainly less than one percent of the proportion that we enjoy.

There is about twice as much carbon dioxide as we have, and perhaps nitrogen as well. Clouds sometimes appear in the Martian air. They are of several kinds: white clouds, probably similar to cirrus clouds on earth, which consist of ice crystals; a peculiar bluish cloud, believed to consist of much finer ice crystals; and others that are yellow in color—perhaps sand or dust storms.

Lichens Might Exist

One kind of vegetation known on earth might be able to exist under Martian conditions, namely, the lichens. Actually there are two different plants—algae and fungi living together, in "symbiosis," the biologist calls it. They share the labor; the fungus protects from cold and holds moisture, while the algae build up organic substances and supply oxygen to the system.

On our planet they grow where no other plant can survive, on rocks in the Himalayas as high as 16,000 feet, for example. So it might be that lichens, or some comparable form of vegetation, make up the greenish areas on Mars.

Higher life, especially animal life, seems very unlikely. The chief evidence for any such, in the past, was the so-called canals. These were discovered, when Mars made a close approach in 1877, by an Italian astronomer named Schiaparelli.

He saw what seemed to be a network of straight lines crossing the planet, and called them "canali," which is Italian for "channels." However, the word was translated into English as "canals," and that is what they are now generally called.

Doubtless this mistranslation has had a lot to do with the idea that they are some

sort of artificial structure, since "canal," unlike "channel," connotes a waterway made by man. But a famous astronomer, Percival Lowell, who founded the Lowell Observatory at Flagstaff, Ariz., where some of the most important studies of Mars have been made, did propose a theory that they form a complicated network of actual canals, dug by intelligent beings to carry water supplies around an arid planet.

Few Believe Man-Made

Very few authorities hold to this theory now, and the nature of the canals is still a puzzle that has not been solved. Some think they are merely illusions, for under some conditions, when not seen very clearly, irregular chance markings may look as if they formed straight lines. Others believe that something is there, although they do not know what.

Perhaps, as one astronomer, Dr. Robert S. Richardson of the Mt. Wilson Observatory, has suggested, when we find out some

Celestial Time Table for September

| SEPT. | EST | |
|-------|-----------------|--|
| 1 | 7:29 a.m. | Moon passes Venus. |
| 2 | 11:00 p.m. | Moon nearest, 224,300 miles distant. |
| 4 | 11:00 a.m. | Jupiter on opposite side of sun. |
| | 1:57 p.m. | New moon. |
| 6 | 12:00 mid-night | Mars nearest, distance 35,120,000 miles. |
| 10 | 2:01 a.m. | Moon passes Saturn. |
| | 5:00 p.m. | Earth between Mars and sun. |
| 11 | 7:13 p.m. | Moon in first quarter. |
| 14 | 12:00 p.m. | Moon farthest, distance 251,700 miles. |
| 19 | 9:02 a.m. | Moon passes Mars. |
| | 10:19 p.m. | Full moon (Harvest Moon—for several nights about this date rises at nearly same hour). |
| 22 | 8:36 p.m. | Sun directly over equator, beginning of autumn. |
| 26 | 8:00 a.m. | Mercury between sun and earth. |
| 27 | 6:25 a.m. | Moon in last quarter. |
| 30 | 8:51 p.m. | Moon passes Venus. |
| | 9:00 p.m. | Moon nearest, distance 227,400 miles. |

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, August 25, 1956

MEDICINE

Throw-Away Kidneys

► THE LATEST THING in life-saving artificial kidneys will be a throw-away job in a tin can with garden hose connection.

It was designed by Dr. Willem J. Kolff, the "father" of artificial kidneys, who made his first model secretly during the Nazi occupation of Holland. Working with him on the newest model were Drs. Bruno Watschinger and Victor Vertes at the Cleveland Clinic Foundation in Ohio.

Artificial kidneys, some of them large and costly, are used to "wash" the blood of patients suffering kidney failure. Poisons usually eliminated by the kidneys are removed by running the blood through a dialyzer.

The new canned artificial kidney consists of a stationary coil of cellulose tubing separated by Fiberglas screens. Layers of screen and tubing are sewed in large rolls and coiled around a 10-ounce fruit can.

This is set into a larger can with the garden hose connection for the rinsing fluid at the bottom. The larger can is sealed for shipping and can be opened when needed with an ordinary can opener.

After use, this whole unit can be thrown away, thus eliminating the usual cleaning, sterilizing and setting up which takes much time. Pumps for the blood and rinsing fluid and a tank are still needed. The initial investment need not be more than \$800, Dr. Kolff and associates state.

The dialyzing tin can unit complete with tubing for connection with patient will be mass produced by Baxter Laboratories, Morton Grove, Ill.

The new disposable artificial kidney and results of its use in several cases are reported in the *Journal of the American Medical Association* (Aug. 11).

Science News Letter, August 25, 1956

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AUTOMATION—WHAT'S AHEAD—American Society of Tool Engineers, 12 p., illus., paper, \$5.00. Single copies free to company executives when requested direct from publisher, 10700 Puritan Ave., Detroit 38, Mich. Findings of a survey of the Society's 34,000 members.

CHEMICAL ENGINEERING KINETICS—J. M. Smith—McGraw-Hill, 402 p., \$8.00. Presenting sound design methods for several types of reaction equipment. Suitable for fourth-year undergraduates and graduate students.

THE CHEMISTRY AND TECHNOLOGY OF WAXES—Albin H. Warth—Reinhold, 2d ed., 940 p., illus., \$18.00. A ready reference work for chemists and industrialists.

CHINESE PORCELAINS FROM THE ARDEBIL SHRINE—John Alexander Pope—Freer Gallery, (Smithsonian) 194 p., 142 plates, \$10.00. Report of a great collection of Chinese porcelains assembled more than 300 years ago on the shores of the Caspian Sea, some 4,000 miles from where they were made.

COMMON EXOTIC TREES OF SOUTH FLORIDA (Dicotyledons)—Mary Franklin Barrett—University of Florida Press, 414 p., illus., \$8.50. A book for the botanist or the nature lover to take with him on any trip to Florida. With the botanical description of each tree is a notation telling just where in Florida the tree can be seen.

CRYPTANALYSIS: A Study of Ciphers and Their Solution—Helen Fouche Gaines—Dover,

237 p., paper, \$1.95, cloth \$3.95. An inexpensive, student edition of a standard text on modern scientific methods of cryptography.

DEAD TOWNS AND LIVING MEN: Being Pages From an Antiquary's Notebook—Sir Leonard Woolley—Philosophical Library, 220 p., illus., \$6.00. A delightful collection of reminiscences of a noted archaeologist.

HUMMER AND BUZZ—Louise Dyer Harris and Norman Dyer Harris—Little, Brown, 55p., illus. with drawings by Robert Candy, \$2.50. The story of two very different creatures, bird and bee, who buzz from flower to flower, collecting nectar with elongated tongues.

IN SEARCH OF ADAM: The Story of Man's Quest for the Truth About His Earliest Ancestors—Herbert Wendt, translated from the German by James Cleugh—Houghton Mifflin, 540 p., illus., \$6.50. The story of prehistory as linked with the lives of men who have contributed to the great search for the earliest ancestor.

MAGIC BULLETS: The Story of Man's Valiant Struggle Against Enemy Microbes—Louis Sutherland—Little, Brown, 148 p., illus., \$3.00. Simply told story of the development of modern medicine from the discovery of the microscope.

MEASUREMENTS OF MIND AND MATTER—G. W. Scott Blair—Philosophical Library, 115 p., illus., \$4.50. The science of measurement cuts across all the fields of science, from the measurement of the movement of electrons to the measurement of human intelligence. This book is written for the layman.

MINERALS AND THE MICROSCOPE—H. G. Smith, completely revised by M. K. Wells—Macmillan, 4th ed., 148 p., illus., \$3.00. A modernized revision of a book known to several generations of students of geology and petrology.

MODERN HYPNOTISM: Key to the Mind—S. J. Van Pelt—Associated Booksellers, 88 p., illus., paper \$1.00, cloth \$2.50. A simply written booklet by the president of the British Society of Medical Hypnotists explaining hypnotism for the general practitioner and layman, its dangers and its benefits in the hands of a skilled physician.

NEW CHANNELS FOR THE GOLDEN YEARS—Thomas C. Desmond and others—New York State Joint Legislative Committee on Problems of the Aging, 151 p., illus., paper, single copies free upon request to publisher, 94 Broadway, Newburgh, N. Y. Focusing attention on preventive measures directed against poverty and wastage in old age, physical and mental decline, and inter-generation maladjustments.

OCCUPATIONAL HEALTH NURSING—Mary Louise Brown in association with John Wister Meigs—Springer, 276 p., \$4.50. Advice and information for the student nurse who is interested in a career in industry.

RURAL WATER SUPPLY AND SANITATION—Forrest B. Wright—Wiley, 2d ed., 347 p., illus., \$4.96. Designed with the needs of the school classroom in mind, the subject matter is also of interest to the rural home owner and the farmer who must plan, construct and service his own sanitation system.

SAILING ALONE AROUND THE WORLD—Captain Joshua Slocum—Dover, 294 p., illus., paper, \$1.00. A new inexpensive edition of a famous adventure story that first appeared serially in the *Century Illustrated Monthly* magazine in 1899-1900.

THE SHY CHILD—Helen Ross—Public Affairs Committee, Public Affairs Pamphlet No. 239, 28 p., illus., paper, 25 cents. Describing different reasons why a child may be slow to join the other children in play when he first goes out into the big world of school or kindergarten, and telling the parent what he can do to help.

SOME FACTS ABOUT PUBLIC STATE TRAINING SCHOOLS FOR JUVENILE DELINQUENTS—U. S. Children's Bureau—Govt. Printing Office, 39 p., paper, 25 cents. An estimated 45,000 children were in training schools between October 1, 1952, and Sept. 30, 1953, the period of the survey reported here.

TRANSPORT AND ACCUMULATION IN BIOLOGICAL SYSTEMS—E. J. Harris—Academic, 291 p., illus., \$7.80. How inorganic and simple organic substances move between body cells and their surroundings.

THE TRICKSTER: A Study in American Indian Mythology—Paul Radin with commentaries by Karl Kerényi and C. G. Jung—Philosophical Library, 211 p., \$6.00. The trickster myth of the Winnebago Indians was also known to the ancient Greeks, the Chinese, the Japanese and in the Semitic world. The mischievous central character, Dr. Jung explains, represents man's unconscious.

THE UPPER PALEOCENE MAMMALIA FROM THE ALMY FORMATION IN WESTERN WYOMING—C. Lewis Gazin—Smithsonian, Miscellaneous Collections, Volume 131, Number 7, 18 p., 2 plates, paper, 35 cents.

YOUR ADOLESCENT AT HOME AND IN SCHOOL—Mary and Lawrence K. Frank—Viking, 336 p., \$3.95. Bringing together for parents ideas about adolescents from many different sources.

Science News Letter, August 25, 1956

GEOLOGY

Geologic Study of Sierra Key to Water Problems

► THE KEY to southern California's pressing water problems may lie in the geological history of the Sierra Nevada mountains during the last million years.

This is the opinion of Dr. William C. Putnam, geology professor at the University of California at Los Angeles, who is compiling the geological history of the rugged mountain range.

Dr. Putnam's studies have been concentrated in the upper end of the Owens Valley and along the eastern margin of the Sierra, an area vital to Los Angeles water supply. They showed that periods of drought have alternated with periods of more than abundant water supply, and that these periods can be correlated with glacial activity. As glaciers receded, desert drought increased.

Other phases of the study are related to a chain of lakes and spillways once connecting Mono Lake to Death Valley. This lake chain and connecting overflow channels dwindled and in part disappeared with glacial recession.

Dr. Putnam believes further geological study of the region is important to long-range planning in bringing water to southern California. A better understanding of climatic cycles is needed and engineering aspects demand more detailed geological information, he said.

Science News Letter, August 25, 1956

A MATH COURSE THAT FIGURES!

More and more in our dynamic economy, a knowledge of basic mathematics pays off!

Whether in Engineering, Electronics, Mechanics, Construction, Pure Science, etc.—or in Estimating, or Trade and Finance, or Buying and Selling, etc.—the man who gets there fastest with the **MATH-WISE**, is likely to be rewarded handsomely!

Fortunately, there now exists, in a single volume of 240 fact-packed pages (including 195 clarifying illustrations), a basic course in mathematics, from arithmetic to the calculus, arranged logically and in order of difficulty. Explanations of principles are followed by worked examples.

This one-volume math "library" economizes not only your money but, more important, your time. Amazingly, the author, with a rare talent for simplifying the complicated, covers the whole gamut: treatment of fractions, decimals, square root and cube root, logarithms, progression averages, interest, algebra, equations, graphs, plane and solid geometry, trigonometry, differential and integral calculus; useful mathematical tables; summary of mathematical formulas, etc., etc.

This remarkable work which already has aided thousands, will be of enormous help not only to those who have forgotten their mathematics but also to those now acquiring it. You may try it out at our risk. ORDER NOW:

A REFRESHER COURSE IN MATHEMATICS by F. J. Cunn

240 Pages • 195 Illustrations
2.95 Postfree • 10-Day Money-Back Guarantee
EMERSON BOOKS, Inc., Dept. B38-K
251 W. 19th Street, New York 11

PSYCHOLOGY

Traffic Violators Normal

► **HABITUAL TRAFFIC VIOLATORS** are as intelligent as most people and as well balanced.

Studies of 300 habitual traffic violators by two University of California at Los Angeles scientists directly contradict theories that habitual offenders are morons or neurotics.

The research shows the habitual traffic violator is white, male, has average intelligence, is a semi-skilled or skilled worker, is between the ages of 21 and 25, and drives between 26 and 50 miles a day.

The violator also comes out about average in personality evaluation. Interviewers tried to learn each offender's attitude toward the law, his attitude toward police enforcement, his concept of himself with regard to driving, his concept of a good or bad driver, his belief as to how he could improve, his reasons for pleading guilty or not guilty, his idea of the worst possible driving offense, his intelligence and his personality characteristics.

One part of the study consisted of a more intensive analysis of 100 cases.

Most of these violators, the report shows, had opinions that were "substantially in accord with the law."

Only 12% gave negative opinions or expressed dissatisfaction with legal standards, and 28% either had no opinion or failed to answer.

However, the offenders' attitudes toward police were quite different. Nearly one-third resented police. The scientists say "it appears that the violators are more opinionated about the police than about the traffic laws, and that the criticism of the

traffic laws is more favorable than the criticism of police."

Only nine percent thought of themselves as poor drivers; 86% thought they were "at least fair" drivers and the rest did not express an opinion.

Of 61 persons who were asked what they thought were the worst kinds of driving offenses, more than a third said drunk driving, 16% named speeding, and five percent listed hit-and-run driving.

Of the 300 persons studied, more than half were described as "normal," 17% as "conforming" and 22% as "aggressive." Less than two percent were labeled "hostile."

The personalities of 100 offenders were studied more intensively. Based on their statements during the interview, 44% of this group were considered "normal." Thirteen percent were called "aggressive" or "extremely extroverted," 28% "appeared to be introverted perhaps with some personal problems," and 13% were classified as "individuals who probably needed some clinical attention and treatment." Two percent were considered not classifiable.

The researchers, Drs. Harry W. Case, Ismar Reiter, Ernst A. Feblowicz and Roger G. Stewart, concluded that prevention or correction through training, rather than punishment, may be one of the solutions to the problem.

The scientists from the University's Institute of Transportation and Traffic Engineering made their report to the Highway Research Board of the National Academy of Sciences.

Science News Letter, August 25, 1956

NUTRITION

Freeze Fall Lunches Now

► **A WAY** to beat the morning rush hour at home when school lunches must be packed along with breakfast preparation is to make up the luncheon foods, such as sandwiches, cookies and fruit now, and store them in the freezer until time to pack the lunches each morning next fall.

The trick might also serve for late summer picnics and lunches carried to work.

Th idea comes from Dr. Faith Fenton of the New York State (Cornell) Experiment Station. She says the lunch can be fresh-tasting if prepared the night before or even weeks in advance and kept in the freezer.

Food taken from the freezer for the lunch box in the morning will be thawed by noon. Dr. Fenton points out that it actually may taste better than food prepared and packed fresh that morning and kept in a warm locker for several hours.

Sandwich fillings suitable for freezing are meat, poultry, and cheese spreads of all kinds, egg yolk mixtures, and peanut butter and other nut pastes. Fillings that do not

freeze well are those with raw vegetables, hard-cooked egg whites and fruit jellies.

Raw vegetables—celery, carrots, cabbage and others—can be put in the lunch box in the morning. Lettuce or tomatoes, wrapped in wax paper and carried in the lunch box, can be added to the sandwiches at lunch time. The frozen foods in the box act as a refrigerator to keep the vegetables crisp, and cooling the lunch box itself helps to keep foods cool and fresh-tasting.

Wrap such luncheon foods as sandwiches, cookies and fruit separately in individual servings and store in the freezer until time to pack the lunch. To avoid mixing different flavors, package each item individually.

Making sandwiches from frozen slices of bread has also been suggested by the U. S. Department of Agriculture to save time and keep the fresh quality of bread. Bread is easier to spread frozen than when soft or crumbly. When the slices thaw, they have the characteristics of fresh bread.

Science News Letter, August 25, 1956

HARRY ROSS SPECIALS

Brand New BINOCULARS



NOT rebuilt, repaired or shop-worn junk. You are the first (and only one) to handle and use the binoculars you buy. Leather case and two straps supplied at no extra cost. Prices include Federal Excise Tax. Here is ALL you pay—no more!

"CENTER FOCUS CARL ZEISS" TYPE

| | |
|---------------------|--------------------|
| *6 x 35.....\$26.56 | 7 x 50.....\$30.51 |
| 8 x 25.....20.34 | 10 x 50.....31.64 |
| 8 x 30.....23.73 | 16 x 50.....39.55 |
| 7 x 35.....30.51 | 20 x 50.....57.62 |

*EXTRA WIDE FIELD,

Note: No Glass offered on "trial basis". Buy any two, get 5% off prices quoted. Buy any three, get 10% off prices quoted. All binoculars of excellent Japanese import.



GEM STONE COLLECTION

We guarantee this beautiful compendium of 30 genuine gemstones as the most wonderful you have seen, at any price, or your money refunded. It must be handled to be appreciated. 5 1/2" x 4" booklet form with 30 stones (agate, ruby, sapphire, etc.) in "semi-polish" finish. Wonderful gift, only \$3.00 pp.

Gem Carbide Scriber . . .

Write on Metals, Glass, Plastics!



A professional tool for scribing, engraving, marking, cutting on hardened steels, metals, glass, gems, ceramics, plastics, etc. Recommended for use by artists, chemists, designers, scientists, hobbyists. Carbide Scriber is tipped with hardest metal made, harder than Sapphire. Easy to resharpen.

Only
1.50
Postpaid

For Better Eye Care!

MAGNIFYING EYE MIRROR

Exceptionally useful to remove dust or particles from the eyes; unwanted and ingrown hairs from eye area. Excellent for eye make-up. Precision made of the very finest quality white optical glass, 1 1/2" in diameter. MAGNIFIES 5 TIMES. Polish is best possible on glass. Packed in lucite case.



Only \$2.50 Ppd.

DESK MAGNIFIER



Handy necessity for home and office. Beautiful pitch polished, pure white optical crown glass lens mounted in satin black anodized aluminum ring mount with plastic fluted handle. 3 1/2" power lens, 1 1/2" diameter. From choice Gort. surplus. Complete with zippered simulated leatherette case. Worth many times our low,

low price!

ONLY \$1.25 POSTPAID

Catalog—complete—\$1.00, none free, deductible from first \$10.00 purchase. Include postage please. No open accounts. No C.O.D.

Harry Ross

TELESCOPES

MICROSCOPES

61 Rensselaer Street (Box 3)

NEW YORK 7

NEW YORK

TECHNOLOGY

Tomorrow's Atomic Fleet

► THE ATOMIC MERCHANT SHIP now being planned is just the beginning.

Scientists have taken a long look into the future and come up with this picture of tomorrow's merchant fleet:

1. Fishing vessels will be floating factories. All the steps involved in processing, including the new atomic method of food preservation by irradiation, will be carried out aboard one big ship that will remain at sea all year. The finished products will go straight from ship to market.

2. "Mining ships" will drill for oil on continental shelves far from their sources of fuel and supplies. There may be less reliance on Middle Eastern oil fields.

3. Rough weather will not be a cause of seasickness on tomorrow's atomic vessel. Ships will simply submerge beneath the waves into the undisturbed subsurface waters. Today's large vessels are unable to do this because conventional fuels require oxygen.

4. Icebreakers will be able to smash through Arctic ice packs without making the long return voyage for supplies each fall. They will be able to remain locked in frozen northern waters all winter if neces-

sary, because space which would be used for fuel today can be used for food tomorrow.

5. The merchant ships of 1980 may be much faster than those of today. Scientists say no one knows the limits of an atomic ship's speed.

6. The ships will be larger and will therefore require larger canals.

The scientists base their predictions on the known advantages of atomic power. Atomic ships will be able to go one to two years without refueling. Fuel will take up less space. The larger the atomic reactor, they point out, the more economical it is to operate.

The pioneer atomic ship, whose first outlines will appear on drawing boards within a few weeks, may be either a large tanker, a dry cargo ship or a combined cargo-passenger vessel. No definite type of reactor has been decided upon, but scientists say the quickest to build would be a pressurized water system similar to that used on the atomic submarine, Nautilus.

The Atomic Energy Commission is considering about 20 other types of reactors.

Science News Letter, August 25, 1956

BIOLOGY

Pictures of Insect Noises

► PICTURES of insect noises can be made by anyone with a tape recorder, Scotch tape and magnetic powder, an American husband and wife research team report.

Their method for producing pictures of sounds is "simple, direct and uses no expensive equipment," Dr. Hubert and Mable Frings of Pennsylvania State University state in *Nature* (Aug. 11).

To make visible the patterns of sounds, which they call "ferrograms," the recorded surface of the tape is drawn through a thin layer of dry carbonyl iron powder spread on smooth paper. The excess powder is then blown or snapped off the tape.

The powder sticks on the tape where it has been uniformly magnetized by the recorded sound. The images thus formed can be photographed or removed from the tape by applying to it the sticky surface of Scotch tape. The adhesive tape can be fastened on white paper or on film for permanent storage and detailed study.

After the pattern has been copied or removed, the recording tape is wiped free of powder.

Spacing of the bands on the tape is related to the frequency and time distribution of the sound. Density of the clinging iron powder shows how intense the sound was.

Recording level must be relatively high to develop the patterns, Dr. and Mrs. Frings warn, since there is a point below which no powder will stick. The method is thus "particularly suitable" for such

noises as the sounds of many insects, because the instantaneous intensity of the note may be very high, although the average intensity is not.

Their technique is a modification of one reported by F. Pasquell, who used a liquid suspension of ferromagnetic powder to make visible pictures of animal sounds.

Since the speed of the recording tape is known, the husband and wife team point out, the duration of the chirps in the "song" of a grasshopper can be measured directly, even though the notes are only one-fiftieth to one-tenth of a second apart.

Their work was supported in part by a grant from the National Microbiological Institute, National Institutes of Health, Public Health Service, in Bethesda, Md.

Science News Letter, August 25, 1956

NATURAL RESOURCES

Plastic Film Saves Water on Farms

► LININGS of plastic films are being tried to prevent loss of water by seepage from farm reservoirs and irrigation ditches.

Experiments by the U. S. Department of Agriculture's Agricultural Research Service and the Utah Experiment Station show that both vinyl and polyethylene (PE), when used as film for lining reservoirs and canals, will reduce the loss of water.

Science News Letter, August 25, 1956

Questions

ASTRONOMY—Where can Mars be seen? p. 122.

□ □ □

CHEMISTRY—How have chemists obtained new knowledge on the background of missing link animals? p. 120.

□ □ □

ENGINEERING—Why are scientists studying brick masonry? p. 118.

□ □ □

MEDICINE—What is the best treatment for heatstroke victims? p. 121.

□ □ □

NATURAL RESOURCES—What is Mission 66? p. 119.

□ □ □

PUBLIC HEALTH—How much has a vaccine cut incidence of adenovirus diseases? p. 119.

□ □ □

Photographs: Cover, Bell Telephone Laboratories; p. 115, Corning Glass Works; p. 119, Philco Corporation; p. 120, Pioneer Plastics.

PUBLIC HEALTH

Two-Thirds of U. S. Has Hospital Insurance

► TWO-THIRDS of the population of the United States is now covered by hospital insurance, either Blue Cross-Blue Shield or some other kind.

As of July 31, the Health Insurance Council in New York estimated some 110,000,000 persons, an all-time high, were covered by hospital insurance, while 94,000,000 had surgical protection, 58,000,000 had policies that cover regular medical expenses and 7,000,000 were insured against major medical expenses.

Science News Letter, August 25, 1956

Do You Know?

Creosote is the best known wood preservative.

Some species of mites have as many as seven to eight generations a year and in orchards may run 150 to 200 individuals per leaf.

Regular semi-conductor grade of silicon, used in electrical and electronic devices such as transistors, is priced today at \$350 a pound.

After 38 years of silviculture testing, three species of trees, boxelder, green ash and the shrubby silver buffaloberry, emerged as suitable for farm wind-breaks in the severe climate of the northern Great Plains.

Clay mineral crystals are made up of atoms arranged in layers, much as eggs are arranged in layers in an egg crate.

GERONTOLOGY

Advice for Retired Women

► **SINCE ONE-FOURTH** to one-fifth of a person's life these days may be lived in so-called retirement, meaning after retirement from a job, it is important to plan ahead how that time will be spent.

Some suggestions on this were given at the meeting of the American Home Economics Association as follows:

1. Decide what values are most important to you.
2. Do not break all old ties too suddenly.
3. Be cautious about changing climates.
4. Cultivate quiet interests.
5. Limit your range of physical activities.
6. Decide whether it is worthwhile to keep up a home.

The suggestions came from Mrs. Isabel B. LaFollette, wife of the former governor of Wisconsin. She described three Women's Exchange Services she was instrumental in establishing in Wisconsin a few years ago. The exchanges find part-time jobs, chiefly for the older women in the community who want or need remunerative work outside their homes.

The idea is an adaptation of the widely known Women's Exchanges for cooking and handiwork. The Service Exchanges offer counseling as well as job placement, and have been highly successful.

The majority of the women enrolled in the Madison Exchange are in the age group of 35 to 55.

"On the whole, age has not been a problem in placing applicants, since most of the women have been adaptable and realistic in meeting employment demands," Mrs. LaFollette reported. "As elsewhere in the country, we can never supply enough office workers, but we have succeeded in gradually building up what I call the personal service occupations—practical nursing, housekeeping, pinch-hitting for the mother."

More women could be encouraged to take homemaking positions where they are so badly needed if the prestige of jobs of this sort were higher, Mrs. LaFollette believes.

Science News Letter, August 25, 1956

AERONAUTICS

Early Warning Radar Plane for Research

► **THE U.S. NAVY'S** newest early warning radar plane looks like a flying saucer that captured an airplane.

The research aircraft is a Navy WV-2 Super Constellation to which a large, disk-shaped parasol, more than 30 feet across, is attached. This is the radome, housing the distance-determining radar antenna.

First tests of the new plane will involve dashes down the runway at Lockheed Aircraft Corporation's terminal, Burbank, Calif. These runs are to evaluate aerodynamic characteristics of the disk and its effect, if any, on stability and control of the aircraft.

Science News Letter, August 25, 1956

ORNITHOLOGY

"Lost Soul's" Lament Ascribed to Jungle Bird

► **INDIANS** call it "the lost soul," but Smithsonian Institution scientists say the eerie cry comes from a seldom-seen bird related to the North American whippoorwill.

The sorrowful cry rends the night air at the Smithsonian Institution's tropical preserve, raising gooseflesh on visitors. Natives on Barro Colorado Island in Gatun

Lake, location of the Panama Canal Zone preserve, call the bird "alma perdida," the lost soul.

The late Dr. Frank M. Chapman, noted ornithologist with the American Museum of Natural History, said he "never heard such a human sound from a brute before." The cry has been described as "a woman's voice, a deep, mellow contralto calling in hopeless grief."

A Balboa woman said when she heard it she thought a neighbor's wife was being beaten.

Science News Letter, August 25, 1956

Unusual Objects of Science

Complete Collection - \$13.50

75c each ★ 3 for \$1.50

We will send you, postpaid, any unit of THINGS of science listed below. Each experimental kit has, in addition to science specimens, its own leaflet of description with many experiments suggested. This collection will start your own laboratory and science museum.

- | | |
|---|---|
| <input type="checkbox"/> Prince Rupert's Drops #36 | <input type="checkbox"/> Nails #150 |
| <input type="checkbox"/> Sweetness #48 | <input type="checkbox"/> Synthetic Fibers and Rope #153 |
| <input type="checkbox"/> Vinyl Resin Fiber #85 | <input type="checkbox"/> Fertilizer Chemicals #161 |
| <input type="checkbox"/> Fungicides #96 | <input type="checkbox"/> Lodestone #163 |
| <input type="checkbox"/> Mineral Hardness #109 | <input type="checkbox"/> Urea Chemical #164 |
| <input type="checkbox"/> New Cotton Developments #127 | <input type="checkbox"/> Food Packaging #165 |
| <input type="checkbox"/> Sea Shell #129 | <input type="checkbox"/> Modern Electronics #166 |
| <input type="checkbox"/> Color Vision #130 | <input type="checkbox"/> Pharmacology #169 |
| <input type="checkbox"/> Paper Chromatography #133 | <input type="checkbox"/> Top #170 |
| <input type="checkbox"/> Motion Picture #134 | <input type="checkbox"/> Seed Germination #177 |
| <input type="checkbox"/> Pyrethrum #138 | <input type="checkbox"/> Modern Cotton #179 |
| <input type="checkbox"/> Highway Safety #140 | <input type="checkbox"/> Horology #180 |
| <input type="checkbox"/> Fiberglass-Plastics #143 | <input type="checkbox"/> Chemical Indicators #181 |
| <input type="checkbox"/> Multi-Layer Wood #147 | <input type="checkbox"/> Straight Line #186 |
| <input type="checkbox"/> Fibers of the Pacific #149 | <input type="checkbox"/> COMPLETE COLLECTION |

☐ Enter membership at \$5 a year

Since quantities are limited, we shall substitute other units for those unavailable.

ORDER TODAY

To: SCIENCE SERVICE, 1719 N Street N.W., Washington 6, D. C.

For the enclosed \$..... please send me postpaid, the units of THINGS of science checked above.

Name.....

Street.....

City, Zone, State.....

8-25-6

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin B46. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

FIRE MAKER for barbecue grills and fireplaces is a self-contained portable unit. Operating off flashlight batteries, the fire starter has an enclosed electric motor and rotary blower. It can be attached to any grill and will ignite charcoal in 10 minutes.

Science News Letter, August 25, 1956

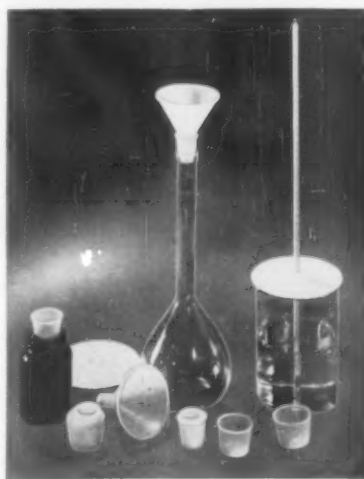
ADJUSTABLE CASTER or *Glide* is also interchangeable. The double ball bearing caster is designed for leveling and stabilizing furniture or equipment used on uneven floors. No wrenches or locknuts are required to make the adjustment. A plastic glide can be used in place of the wheel type caster.

Science News Letter, August 25, 1956

LIGHTWEIGHT TENT for the hiker and backpacking camper is highly water- and mildew-resistant. Measuring eight feet by eight feet, with a six-foot center height, the tent has an insect-proof netting door with a two-way zipper, a sewed-in floor and wide awning. Weighing 11 pounds, the tent is equipped with a telescoping aluminum pole and aluminum stakes.

Science News Letter, August 25, 1956

UNBREAKABLE LABWARE molded of a polyethylene resin provides laboratories with virtually indestructible tools. The labware, shown in the photograph, is corrosion-resistant to most chemicals and affords maximum stiffness over a wide range of tem-



peratures. Thistle tube tops, powder funnels, funnel holders and stoppers are available.

Science News Letter, August 25, 1956

WOOD LATHE for the home craftsman is a variable-speed, 12-inch tool. Adaptable to spinning, polishing, sanding, fluting and reeding, as well as all inboard and outboard turning operations, the lathe has

speeds of 340 rpm to 3,200 rpm. There are more than 50 engineered accessories available for the lathe.

Science News Letter, August 25, 1956

ELECTRICAL SYMBOL TEMPLATE conforms to the new and revised graphical symbols prepared by the American Standards Association. Necessary in order to meet military specifications, the template is available in three sizes.

Science News Letter, August 25, 1956

MINIATURE SAFES with combination locks can be installed anywhere. An anchored floor plate secures the safes and makes them a part of the floor. The safes are available in two sizes, five by six by 12 inches and four and one-quarter by five by six inches. The smaller weighs three and one-half pounds and the larger one, ten pounds.

Science News Letter, August 25, 1956

ETCHING-SOLDERING KIT for home use is complete with solderer, electric pen and transformer. The pen can be handled like a conventional writing pen and will mark all soft, hard or hardened metals. The shockproof pen permits the home workman to do his own electric engraving. The units can also be operated on automobile batteries giving two, four or six volts.

Science News Letter, August 25, 1956



Nature Ramblings



By HORACE LOFTIN

► THAT STRANGE RACE of human beings called birdwatchers often find all sorts of "new species" of birds during the late summer months—especially the beginning birdwatchers. Birds with astounding feather patterns suddenly crop up, while the early summer birds seem to vanish.

Actually, there are no "new species" on the scene nor have the old birds gone away. What the late summer birdwatchers are seeing are adult birds in the process of losing their old feathers for their new fall coat, and the young birds of the year gaining their first adult plumage.

Many startling changes appear in the bird life of an area as the summer wears on, with fall just around the corner. Most of the rearing of new families is completed, and the young birds are able to fend for themselves.

At this time, many of the best songsters

Summer Changes



cease their singing. Birds that were pugnacious defenders of their solitude during the nesting and rearing period suddenly begin to congregate in large sociable flocks, feeding and roosting together.

Even such a familiar figure as the cardinal, or red bird, may create a problem in identification during the molting period of late summer. Bright red feathers are

mottled with brown, creating a confusion of color—and each cardinal seems to be a little different from the other. Sleekness gives way to a ragged appearance, as old feathers become loose during the molting.

The cardinal, unlike many other song birds at this season, still retains his cheery song, and this keeps alive some of the waning brightness of bird life in an area.

However, the birdwatcher should be alert during the "dog days." His odd-colored birds may not be new to science, but they may be new species for his life list!

Many species begin random wanderings during the late summer weeks, traveling long distances from their birthplaces. This is not to be confused with fall migration, since the birds may fly north as well as south at this time.

It is during this period of wandering that many "exotic" species are found way off their usual beat—and perhaps in your backyard.

Science News Letter, August 25, 1956